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3 INSECTICIDE PROGRAM FOR RASPBERRY AND LOGANBERRY FRUIT WORM CONTROL //

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The 1937 insecticide program for the control of the raspberry and loganberry fruit worm differs from that prepared in 1936 in that much later applications of insecticides are recommended and the use of lead arsenate is not recommended owing to the danger of excessive poisonous residue on the harvested berries and also because lead arsenate may cause serious injury to some varieties of raspberry. Applications of either ground derris or cube root will give satisfactory control of the raspberry and loganberry worm, if the work is done properly, whether such applications are made in the form of a spray or as a dust. In general, however, sprays have given better results than dusts in the control of this pest.

### SPRAYS

Three applications of sprays containing finely ground derris or cube root powder are necessary for the best results. The first spray should be applied 10 days after blossoming begins, the second 10 days after the first, and the third 10 days after the second. ~~if~~ but two sprays are used, the first spray should be applied 10 days after blossoming begins and the second 20 days later. The last spray, if applied later than recommended, may leave an unsightly residue on the harvested fruit, particularly if derris or cube root low in rotenone is used, thus making it necessary to use a large quantity of the material. The derris or cube powder should be made into a paste with a small quantity of water before adding it to the water in the spray tank.

The quantity of derris or cube root required for the making of a satisfactory spray depends upon the percentage of rotenone in the root. A statement of the percentage of rotenone should be required, therefore, when purchasing derris or cube root powder. The quantity of derris or cube root of various rotenone contents which is required to make 100 gallons of spray of the proper strength is shown below:

Percent of rotenone in root	Number of ounces of derris or cube root per 100 gallons of water
5	27
4	34
3	44 $\frac{1}{2}$
2	67

In any event the spray should contain approximately 0.01 percent of rotenone.

It is important to spray thoroughly on both sides of each row and better results will be obtained if little or no breeze is blowing during the spraying operation. Since a few warm days will cause rapid development of the blossom buds, the grower should obtain his insecticides in advance, and be prepared to apply them on short notice.





## DUSTS

The time of application for the dusts should be the same as that recommended above for sprays, and 35 pounds per acre should be used for each application.

The dust mixture should contain one-half of one percent (0.5 percent) of rotenone. There does not appear to be any advantage in using a mixture containing a higher percentage of rotenone. For those who wish to purchase undiluted cube or derris root powder and mix their own dusts, the number of pounds of carrier to each pound of root necessary to make a dust of the required strength is shown below for several percentages of rotenone:

Percent of rotenone in root	Number of pounds of carrier to each pound of derris or cube root
5	9
4	7
3	5
2	3

Very finely ground talc, bentonite clay, or tobacco dust are suitable for use as carriers. Lime should not be used for this purpose since lime greatly reduces the effectiveness of these insecticides.

A barrel churn or revolving drum should be used in mixing the dust ingredients. This should contain twenty rounded stones of uniform size having a total weight equal to half the weight of the dust to be mixed. The mixer should not be filled more than about half full and should be turned for at least 15 minutes at a speed that will permit the stones to roll around in the dust while it is being mixed.

Apply dusts early in the morning or late in the evening when there is little or no wind blowing. Do not point the nozzle of the dust gun directly at the plants but direct the dust down the middle near the plants and allow it to drift through between them. Dust both sides of each row. Particular care should be taken in the last application to avoid covering the berries with an excessive quantity of dust, since this may leave an unsightly residue on the harvested fruit.

## CAUTION

In the instance of some persons, the breathing of air containing cube or derris dust causes numbness of the nose and throat. Persons thus affected should avoid breathing the dust as much as possible and, if ill effects are too pronounced, an aspirator should be used while dusting.

Under no circumstances should lead arsenate or any arsenical be applied as a dust or a spray for the control of the raspberry fruit worm after the blossoms have opened. Treatments made after this period may leave dangerous quantities of poisonous residues on the harvested berries. Derris or cube sprays or dusts have the advantage of not leaving poisonous residues on the marketed product.







